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Eurytemora velox (Lilljeborg, 1853) (Copepoda, Calanoida) in the Szigetköz region of the Danube

by
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Abstract: *Eurytemora velox* was found at six localities in the Szigetköz region of the Hungarian Danube in June and September 1991. The specimens are described briefly and some relevant locality data are given.
Key words: *Eurytemora velox*, Copepoda, Calanoida, Danube, Szigetköz

Szigetköz is the westernmost part of the Hungarian Danube section, besides the main river it consists of several side branches, dead arms, irrigation channels and various small, standing waters. This area has been surveyed in order to get information about the aquatic biota, to obtain data about the species composition of the zooplankton communities of the various water bodies. During these investigations both of the authors independently found specimens of *Eurytemora velox* in several samples. This species has not been recorded yet from Hungary. A brief description of our material is given, and our results are compared with previous findings from Europe.

E. velox is the first member of Temoridae recorded from Hungary. In his paper Éber (1955) dealt with the planktonic microflora and -fauna of the rivers of the Carpathian Basin, including the Danube, however, a mere species list was given without exact locality and date. As a member of the zooplankton of the Danube *E. velox* was listed (along with other calanoids such as *Heterocope saliens, H. weissmanni, Eurytemora lacustris*, none of which has been recorded as yet by other researchers from Hungary), but as he collected from the Danube outside Hungary, as well, these data cannot be considered reliable enough concerning the Hungarian fauna. None of the material was deposited in any public collection and nor did he keep a private collection (A. Urbán, pers. comm.). Considering all these circumstances we think that the specimens we have collected should be regarded as first ones from Hungary and, hence *E. velox* is a new species to the Hungarian fauna.

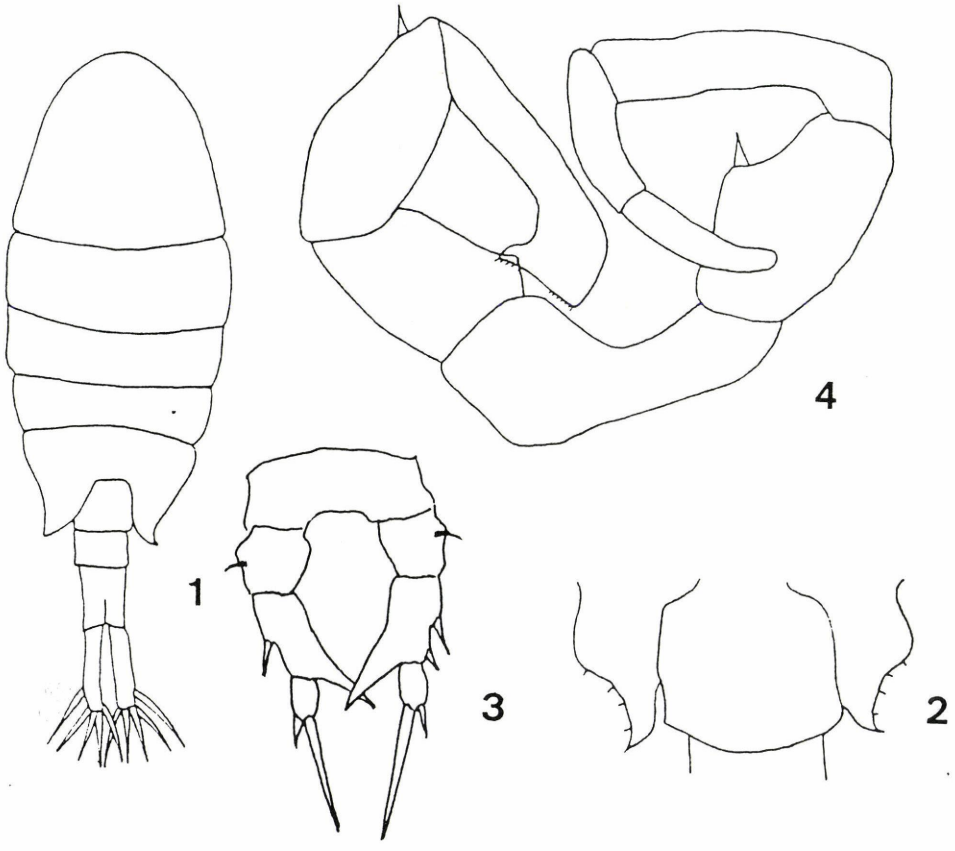
Eurytemora velox (Lilljeborg, 1853)

Description

Female: body slender, cephalosome about as long as the succeeding three segments combined (Fig. 1). Last metasome segment with great lateral expansions, outline S-shaped in dorsal view. Each expansion bears five delicate hairs on the outer margin (Fig. 2). Furcal ramus 4-5 times as long as broad, inner and dorsal surface covered with fine hairs. Penultimate segment of the 5th leg usually with one spine only. This is a species specific feature (see e. g. Sars 1903, Harding &

Smith 1974, Kiefer 1978), although, in our material some specimens had one spine only on one leg, while the other had two spines on this segment (Fig. 3), like that of *E. affinis*. Such a fenomenon has already been observed (Lucks 1937, Petit & Schachter 1947) and was interpreted as the result of hybridization between *E. velox* and *E. affinis*. If this is a proper explanation, then the other *Eurytemora* species should inhabit the Szigetköz area, as well. Further investigations should be carried to solve this problem. Size varied between 1.26-1.58 mm.

Male: urosome of five segments. Furcal ramus 5-6 times as long as broad, 5th leg with ramus of four segments (Fig. 4). Size varied between 1.05-1.36 mm.



Figs 1-4. *Eurytemora velox* (Lilljebprg, 1853). 1 = female in dorsal view;
2 = lateral expansions on the last metasome segment of the female; 3= fifth leg of the female;
4 = fifth leg, male (fine hairs not shown)

Distribution

Fig. 5 shows the geographical distribution of *E. velox* in Europe, the map was made on the basis of Siewerth (1926) and revised after Kiefer (1978). The species is widely distributed in Northern and Western Europe, Western Mediterranean region and at the Black Sea and the Caspian Sea, mostly in brackish waters. Inside the continent it was known from Russia. In the Danube watershed *E. velox*

was recorded in the delta area in Romania. The new record from Hungary does not extend its geographical range, however, it is of great scientific interest that it occurred in the Danube area in the continent quite far away from the delta.

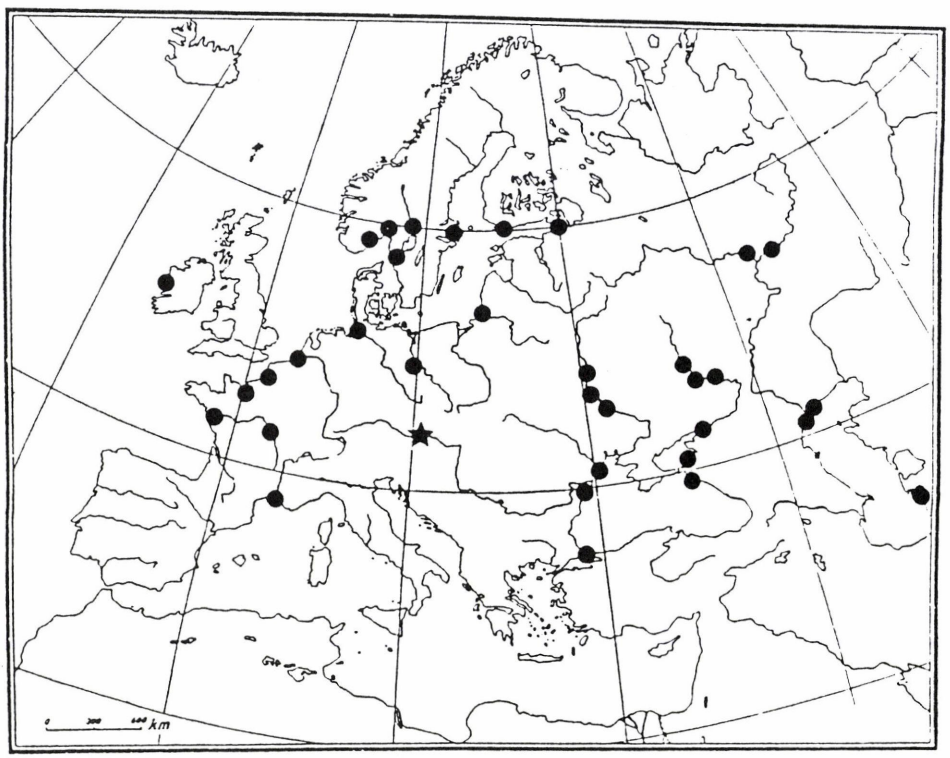


Fig. 5. Distribution of *Eurytemora velox*. Dots indicate literature data, asterisk indicates the Hungarian record

Ecology

Habitat: *E. velox* is an euryhaline species occurring in various brackish waters, ponds, rock pools (Kiefer 1975, Kukert 1984, Britton & Johnson 1987, Lowndes 1935). Kukert (1984) found it at salinities between 4-7 g/l, while Britton & Johnson (1987) at 40-64 g/l. In the Camargue it occurs in temporary waters, does not inhabit large, permanent lakes (Champeau 1970). However, it was frequently found in non-saline waters too (Lescher-Moutoué 1984, Dumont & Gysels 1971). Lowndes (1935) emphasized that this species always occurs among vegetation and unlike *Eudiaptomus gracilis* is seldom found in open water. Siewerth (1926) reported similar observations from Russian rivers, the greatest number of adults was caught at the shoreline of a slowly flowing river section. In Lac de Creteil, an artificial lake in France, *E. velox* was - along with *Eudiaptomus gracilis* - the dominant calanoid in the open water (Lescher-Moutoué 1984).

Table 1 provides data about the chemical features of the localities where *E. velox* was found in this study. These sites are freshwater ones, various channels and ponds, where this species was always found in samples taken at the shoreline. The sample from the open water of the Öntési-tó did not have *E. velox*, while it was collected in the littoral zone and small nearby channels.

Table 1. Chemical features of selected localities of *E. velox*
(Legend: 1 = Zátonyi Duna, Doborgazsziget, at the Hostel, 07. 06. 1991; 3 = Zátonyi Duna, Doborgaz-sziget, at the Hostel, 06. 09. 1991; 4 = Gazfûi Holt Duna, downstream section at the protecting dike, 07. 06. 1991; 5 = Szavai channel, at Patkányosi pump station, 03. 06. 1991; 7 = Ásványráró, Port, 06. 09. 1991)

	1	3	4	5	7
O_2 (mg.dm^{-3})	14.8	-	12.8	8.2	16.2
pH 7.6	-	7.5	7.1	-	
conductivity (μS.cm^{-1})	315	-	850	600	-
K^+ (g.m^{-3})	2.1	2.1	8.3	0.6	-
Na^+ (g.m^{-3})	7.3	6.3	8.8	6.0	-
Ca^{2+} (g.m^{-3})	37.3	40.9	140.0	108.0	-
Mg^{2+} (g.m^{-3})	12.2	13.5	33.6	23.8	-
CO_3^{2-} (g.m^{-3})	0.0	0.0	0.0	0.0	-
HCO_3^- (g.m^{-3})	159.0	201.0	250.0	384.0	-
Cl^- (g.m^{-3})	16.3	17.3	24.4	14.2	-
SO_4^{2-} (g.m^{-3})	10.0	25.0	260.0	54.0	-
NH_4-N (g.m^{-3})	<0.04	-	<0.04	<0.04	-
NO_2-N (g.m^{-3})	0.018	-	<0.003	<0.003	-
NO_3-N (g.m^{-3})	1.1	-	<0.2	<0.2	-
PO_4-P (g.m^{-3})	<0.02	-	<0.02	<0.02	-
Chl *a* (mg.m^{-3})	14.4	-	12.4	7.1	9.4
trophic level	meso-trophic	-	meso-trophic	oligo-meso-trophic	oligo-meso-trophic

Occurrence: *E. velox* usually occurs when temperature is above 10 °C, Lescher-Moutoué (1984) observed its presence between April and October, and its greatest abundance in summer. In temporary saline waters in the Camargue it appeared in spring and disappeared early summer, but occurred again in autumn (Champeau 1970). Siewerth (1926) found it in the warm period only. It is assumed that *E. velox* is able to produce resting eggs.

Dumont & Gysels (1971) found *E. velox* at 11 sites, where 4-19 (mostly more than 10) Cladocera and Copepoda species co-occurred. In North-Germany, in brackish ponds quite few species have been found along with *E. velox*: *D. magna* at one site, while two copepods, *Centropages hamatus* and *Mesochra lilljeborgi* at another locality (Kukert 1984). In the Szigetköz area 6-17 Cladocera and Copepoda species were found in the samples with *E. velox* (Table 2).

Table 2. List of species found with *E. velox*
(Legend: 1 = Zátonyi Duna, Doborgaz-sziget, at the Hostel, 07. 06. 1991, 2 = As No. 1, 05. 09. 1991, 3 = As No. 1, 06. 09. 1991, 4 = Gazfűi Holt-Duna, downstream section at the protecting dike, 07. 06. 1991, 5 = Szavai channel, at Patkányosi pump station, 03. 06. 1991, 6 = Ásványi-Duna, Ásványráró Port, 03. 09. 1991, 7 = As No. 7, 06. 09. 1991, 8 = Öntési-tó, 18. 06. 1991)

	1	2	3	4	5	6	7	8
Cladocera								
Acroperus harpae (Baird, 1835)	+							
Alona quadrangularis (O. F. Müller, 1785)			+					+
Alona rectangula Sars, 1862	+	+				+		
Alonella nana (Baird, 1843)			+		+			
Bosmina longirostris								
var. *pellucida* (Stingelin, 1895)		+		+	+			
var. *typica* (O. F. Müller, 1785)	+	+		+		+	+	
Ceriodaphnia pulchella Sars, 1862								+
Chydorus ovalis Kurz, 1874								+
Chydorus sphaericus (O. F. Müller, 1785)	+	+	+	+		+		+
Daphnia cucullata Sars, 1862				+				+
Daphnia hyalina Leydig, 1860						+		
Daphnia longispina O. F. Müller, 1785	+	+		+				
Diaphanosoma brachyurum (Lievin, 1848)						+		
Disparalona rostrata (Koch, 1841)			+					+
Leptodora kindtii (Focke, 1844)								+
Moina micrura Kurz, 1874						+	+	
Peracantha truncata (O. F. Müller, 1785)	+							
Pleuroxus aduncus (Jurine, 1820)	+	+						
Pleuroxus uncinatus Baird, 1850								+
Scapholeberis mucronata (O. F. Müller, 1785)								+
Sida crystallina (O. F. Müller, 1776)								+
Simocephalus serrulatus (Koch, 1841)	+							
Simocephalus vetulus (O. F. Müller, 1776)			+					+
Copepoda								
Calanoida								
Eudiaptomus gracilis (Sars, 1863)	+			+	+			
Eurytemora velox (Lilljeborg, 1853)	+	+	+	+	+	+	+	+
Cyclopoida								
Acanthocyclops robustus (Sars, 1863)								
forma *limnetica* Petkovski, 1975	+	+	+	+		+	+	+
Acanthocyclops vernalis (Fischer, 1853)					+			
Cryptocyclops bicolor (Sars, 1863)	+							
Macrocyclops albidus (Jurine, 1820)								+
Megacyclops viridis (Jurine, 1820)					+			+
Mesocyclops leuckarti (Claus, 1857)	+	+	+	+	+	+	+	
Metacyclops gracilis (Lilljeborg, 1853)								+
Thermocyclops crassus (Fischer, 1853)								+
Thermocyclops oithonoides (Sars, 1863)	+	+	+	+	+	+	+	
Number of species	14	10	9	10	8	10	6	17

Summary

The presence of *E. velox* was recorded in several sites in the Szigetköz area in June and following a high flood in July specimens were caught in September, as well. We think that this species certainly inhabits these water bodies and has permanent populations here. It is not clear how it did get here, but since it has resting eggs, its passiv dispersal may be facilitated by bird migration. Some females were

found to possess a morphological pecularity on the 5th leg, this phenomenon deserves further research. Kiefer (1978) thinks *E. velox* does not show greater morphological variability, but it cannot be excluded that the species is differentiated physiologically. We think that our new record of *E. velox* also urges a thorough revision of the *Eurytemora* species.

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